

Appendix 7

Appendix 7A. Pennsylvania's Testing and Approval Program for Dust Suppressants and Road Stabilizers.

The Pennsylvania State Conservation Commission has addressed the issue of [dust suppressants](#) and road stabilizers by making it clear to manufacturers and vendors that they are responsible for determining the acceptability of their materials in conjunction with accepted toxicity testing protocols. Before a product can be approved for use in the PA Dirt and Gravel Road Program, it must undergo toxicity testing according to federal EPA protocol at a laboratory certified by the EPA. The test results are then interpreted with the requirements of the PA Clean Streams Law, specifically Title 25, Chapters 16 and 93. That interpretation is the basis of whether or not the product is acceptable to the Pennsylvania State Conservation Commission.

Tests are required on all commercial products. The tests are to determine toxicity based on identification, quantity, and behavior of elements and compounds found. The tests will include the 7-day rainbow trout (*Oncorhynchus mykiss*) survival and growth test. Tests with fat head minnows (*Pimephales promelas*) are not acceptable. The 7-day cladoceran (*Ceriodaphnia dubia*) survival and reproduction test is also required. Guidelines for the tests must use the federal EPA protocols. Each test must produce two "No Observed Effect Concentrations" (NOEC), one for survival and growth of rainbow trout and one for survival and reproduction of cladocerans.

In addition, Biochemical Oxygen Demand (BOD) and Chemical Oxygen Demand (COD) values must be obtained for the product. These values are not intended for use in determination of the environmental acceptability of the product but are reference values for use in any potential emergency. (Source: Administrative Manual, Dirt and Gravel Road Maintenance Program, PA State Conservation Commission, March 3, 2005.)

Under the above criteria, the Pennsylvania State Conservation Commission has approved nine different products from six different companies for use at approved application rates in the PA Dirt and Gravel Road Program – four products classified as petroleum emulsion [dust suppressants](#), two products classified as synthetic fluid [dust suppressants](#), and three products classified as acrylic polymer [dust suppressants](#). The products, companies, and approved application rate are as follows:

Petroleum Emulsion [Dust Suppressants](#)

PennSuppress "D", American Refining Group, Inc., Bradford, PA

1:4 emulsion to water or more dilute

Ultrabond 2000, JMG Enterprises, Inc., Seward, PA

1:4 emulsion to water or more dilute

Coherex, D&D Emulsions, Inc., Mansfield, OH

1:10 emulsion to water or more dilute

[Dust](#) Bond, D&D Emulsions, Inc., Mansfield, OH

1:10 emulsion to water or more dilute

Synthetic Fluid [Dust Suppressants](#)

EK35, Midwest Industrial Supply, Inc., Canton, OH

100% active, no water for application

EnviroKleen, Midwest Industrial Supply, Inc., Canton, OH

100% active, no water for application

Acrylic Polymer [Dust Suppressants](#)

Pave-Cryl Suppress, Rohm & Haas Company, North Andover, MA

As-received (51% solids)

Pave-Cryl Suppress Plus, Rohm & Haas Company, North Andover, MA

As-received (51% solids)

DirtGlue, DirtGlue Enterprises, Wakefield, MA

As-received (>50% solids)

APPENDIX 7B. Worksites in Focus

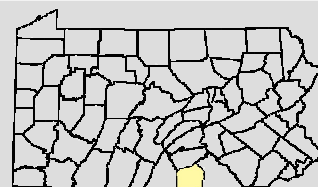
The following worksites are actual projects funded through the Pennsylvania Dirt and Gravel Road Program. The first site was an entrenched township road with saturated ditches, surface [erosion](#), and spring seeps. The project raised the road profile and added pre-fabricated [subdrains](#) to collect subsurface water from under the road and both ditches.

The second site was a Nature Reserve experiencing increased traffic loads from the increase in visitors. This project added a new driveway and parking areas, including bus parking reinforced with a geogrid and French mattress construction for two small drainage ways. The third site was an early demonstration site for the Dirt and Gravel Roads Program. The spotlight is on one aspect of this site, entailing the resetting of an existing 3-foot diameter cement concrete drainage pipe.

Worksite in Focus

Adams County Miltenerberger Road

7/16/05



Problem Identification

Miltenerberger Road was an entrenched road with few outlets for drainage and spring flow to leave the road area. Water was concentrated in parallel ditches and directed 1,200' downhill and under State Route 233 into Conococheague Creek. Water entering the road area had nowhere to go but down the ditches, gaining velocity and erosive force. Adding additional drainage outlets was impossible with the road at an elevation much lower than that of the surrounding landscape. The entrenched road profile also left little room to plow snow (*Photo 1*).

Project Facts

Project: Miltenerberger Road
Project Owner: Franklin Township
Watershed: Conococheague Creek,
Potomac River
Project Length: 800 ft
Date Completed: June 2005

Cost Summary

Total Project Value: \$15,689
District Funding: \$15,689
Materials \$670
Equipment \$4,292
Shale \$10,727



Project Objectives

1. Restore natural drainage by raising the road to achieve sheet flow.
2. Reduce stream impact by providing additional outlets for water currently trapped in road ditches.
3. Address maintenance problems such as saturated ditches and lack of space for snow storage.

Project Considerations

Although over 3,000 feet of Miltenerberger Road was entrenched, cost limitations only allowed for enough shale to raise about 800 feet of the roadbed. Spring water entered the road profile as subsurface flow. This excess water saturated the road and ditches, softening the road base (*Photo 1*). The land surrounding the road is owned by the Bureau of Forestry.

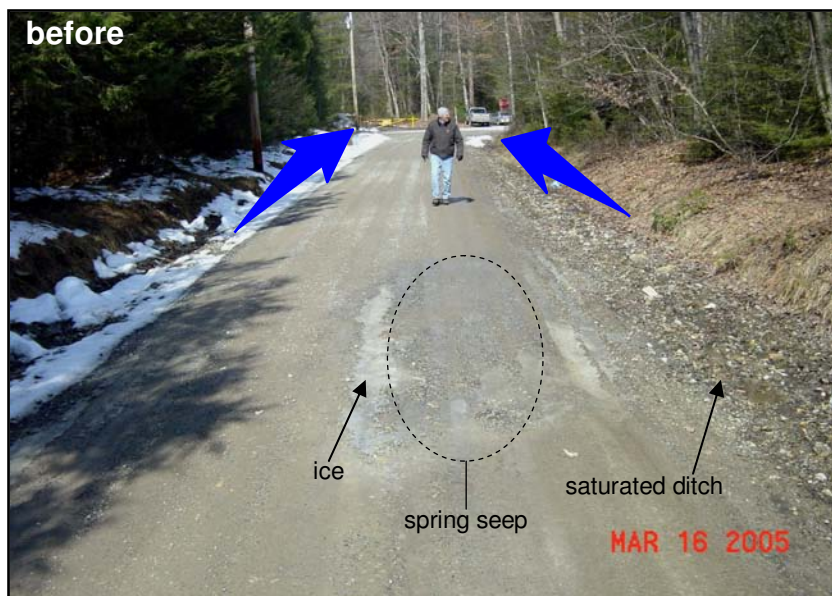


Photo 1. Notice the ice in the middle of the road from a spring seep. The entrenched road profile made it impossible to get water or snow off of the road.



Photo 2. Pre-fabricated underdrain was used to collect subsurface water from under the road and both ditches.

Miltenberger road was raised an average of 3' using shale fill.



Photo 3. The entrenched road traps water in the road area and conveys it down to the stream. Note the elevation of the road relative to the utility pole on the right compared to *Photo 4*.



Photo 4. The road was elevated to eliminate the ditch on the left and achieve sheet flow. The added material also provided the necessary cover to install new crosspipes.

Project Solutions

Install underdrain: Pre-fabricated underdrain (4" perforate pipe wrapped in geotextile fabric) was placed under the road and ditches to collect subsurface water (*Photo 2*). The underdrain will keep clean subsurface water from mixing with road drainage. It will also reduce maintenance by allowing the road and ditches to dry.

Raise the road elevation: Shale was purchased for use as road fill (*Photos 3 & 4*). The shale was spread with a bulldozer and compacted using a vibratory roller in approximately 8" lifts. The road was filled an average of 3' over an 800' length and tapered into the existing road grade on both ends. Filling the road completely eliminates one ditch, and provides the cover necessary to install crosspipes to outlet water from the remaining ditch (*Photo 5*).

Install crosspipes: Because Miltenberger road was so severely entrenched, no crosspipes existed on the road before this project. Crosspipes were needed to divert drainage into vegetated areas and keep runoff from entering the stream. The new road elevation provided the extra cover needed for two shallow crosspipe installations. These crosspipes were outletted at the existing ground elevation to avoid creating an "outlet trench" into the woods. Gradebreaks were constructed over each crosspipe to obtain adequate pipe cover and divert water from running down the roadway (*photo 5*).

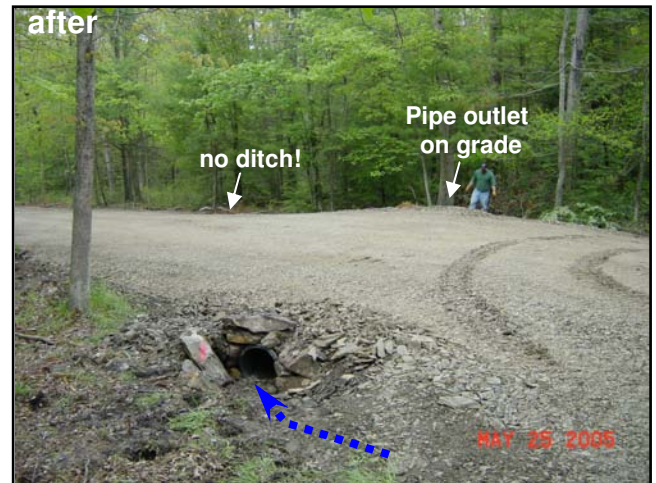


Photo 5. One of two new crosspipes installed. Notice the grade-break in the road over the pipe to get water off the road.

For More Information

The Center for Dirt and Gravel Road Studies

1-866-668-6683 (toll free): www.dirtandgravelroads.org

Adams County Conservation District

(717) 334-0636: user.pa.net/~adamsacd/

Site Map & Directions:

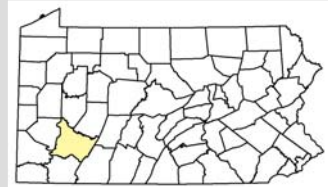
From U.S. Route 30 at Caledonia State Park, follow State Route 233 north approximately 5.5 miles to Miltenberger Road. The worksite begins at the intersection with State Route 233 and continues for 800 feet.



Worksite in Focus

Westmoreland County Powdermill Nature Reserve

11/2/04



Project Background

In need of additional parking, Powdermill Nature Reserve sought an environmentally sensitive solution that handles increased visitors and related traffic loads without an ugly scarring of the surrounding landscape. To accomplish this, the Reserve added:

- A new driveway with Driving Surface Aggregate* (DSA-as modified) to improve circulation and provide second access to Rte. 381;
- 2 new parking areas: a bus parking lane underlain with Geogrid® (see photo below) and a pervious grassed automobile lot (60' x 100').

Project Considerations

Where the new driveway crossed two small drainage ways (see Site Plan below), French mattresses*, constructed of clean stone wrapped in non-woven geotextile fabric, were installed. This low-cost, low-maintenance technique connects the hydrology on either side of the road allowing water to percolate through the stone while the fabric prevents sediment movement.



Above: Construction of the bus parking lane. Geogrid® was used to add support and tensile strength.

* For more information on DSA and French Mattress construction please see the DSA Informational Bulletin and the French Mattress Technical Bulletin available at www.dirtandgravelroads.org.

Project Facts

Project:	Nimick Nature Center Driveway & Parking Lot
Project Owner:	Powdermill Nature Reserve
Affected Watershed:	Powdermill Run, Youghiogheny River
Project Length:	550 ft
Date Completed:	October 2003

Cost Summary

Project Cost:	\$35,049
Geoblock® Parking Lot	\$26,833
Contract	\$1,980
Materials (geosynthetics)	\$1,580
Stone	\$4,056
Tree Removal	\$600
In-Kind Contributions:	\$8,300

This project was completed with monies raised by the Powdermill Nature Reserve.

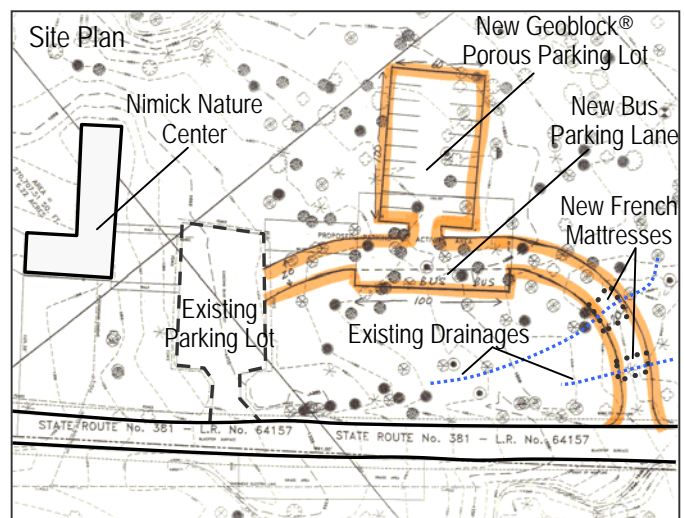
For More Information

The Center for Dirt and Gravel Road Studies
(814) 865-5355
www.dirtandgravelroads.org

Powdermill Nature Reserve

1847 Route 381
Rector, PA 15677

Theresa Gay Rohall
(724) 593-6105



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Driveway Construction Sequence

1. Trees were cleared along the proposed right-of-way and non-woven geotextile fabric was rolled out. Additional lengths of fabric were laid perpendicular to the driveway at two locations to allow construction of the French mattresses (see photo 1).
2. #3 stone was tailgated on top of fabric along the entire length of the right-of-way.
3. The perpendicular fabric sections were wrapped over the #3 stone to create the French mattresses (see photos 2 & 3).
4. #2b stone was tailgated over the entire length of the driveway, including the French mattresses. A modified version of DSA was placed over the #2b stone and rolled to create the driving surface (see photo 4).

Project Results

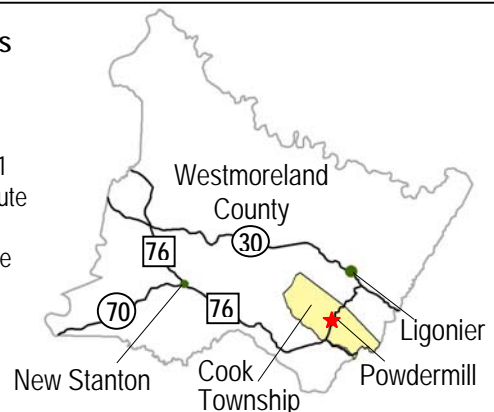
Environmentally sensitive maintenance practices were employed to minimize cost, reduce future maintenance demands and expand visitor infrastructure while staying in tune with natural surroundings. This collaborative project brought together several diverse partner organizations to reinforce Powdermill's environmental ethic that teaches respect for nature by showcasing how human handiwork can "lay lightly on the land."

Project Partners

Powdermill Nature Reserve
Center for Dirt & Gravel Road Studies
Westmoreland Conservation District
Sustainable Forestry Initiative of PA
Kennametal Inc

Site Map & Directions

From the PA Turnpike (Interstate 76), exit at Donegal/Ligonier/PA 711 (#91). Turn left onto Route 31 after the toll booth. Follow Route 31 to Route 381 north. The Nimick Nature Center is 6 miles ahead on the left.



A7B-3. Worksite #3: Hell Hollow Road, Monroe County, PA:

This site was a demonstration project for the Pennsylvania Dirt and Gravel Roads Program on which various practices were demonstrated. One of the sub-sites involved a 36"-diameter cement concrete pipe installed for a stream crossing Hell Hollow Road. Viewing the original site, one can see the voluminous [erosion](#) that had taken place, uncovering the outlet side of the pipe, which had actually lifted, causing water to run uphill through the



A7-01 Hell Hollow Road Demo Site: Existing site conditions prior to project.



A7-02 Excavation of existing pipe during dry conditions.

The pipe could not handle the flows, particularly during the spring rains, causing overflow and damage to the road and continual [erosion](#) of the entire site. This township road with daily traffic of less than 10 cars (<10 [ADT](#)) was in the [watershed](#) of a potable water reservoir. Building an adequately sized bridge was not economically feasible. The solution was to reset the existing pipe and stabilize the entire area to protect against further [erosion](#).

pipe to the outlet side. The inlet side of the pipe was at an elevation that caused water to drop approximately 15" into the pipe entrance, which was causing changes in the stream's profile on the upstream side and thereby affecting the stream [ecology](#). The pipe was also out of alignment with the stream flow, causing tremendous [erosion](#) on the downstream bank, which was in direct line of the pipe outlet flow.



A7-03 Geotextile separation fabric laid in new trench.



A7-04 Bedding material added



A7-05 New line and grade checked

The pipe was excavated and sections set aside. A new line and grade was established to better meet the stream flow conditions. Notice from the photos that all work was done during a dry period with no flow. The new pipe trench was prepared, and a [geotextile](#) separation fabric was then laid in the trench and extended both upstream and downstream. Bedding material was added, and the pipe sections were reset. Since the old pipe joints were not sealed and no sealing was available, the pipe was wrapped in a [geotextile](#) fabric to prevent losing fines through the joints with possible undermining of the material surrounding the pipe. Duct tape held the fabric in place for backfilling.



A7-06 Fabric wrap covers pipe joints, prevents fine material from entering.

After backfilling, the extended fabric was brought up and over the pipe ends, cutting out for the pipe inlet and outlet, and overlapped on top with a road separation fabric. Thus the whole pipe and backfill area was encased in fabric. Water could move through the pipe and through the



A7-07 After backfilling, fabric brought up and over pipe ends to encase entire installation.

surrounding backfill, but the fabric prevented material removal, eliminating the [erosion](#) potential. The pipe end areas received large [riprap](#) to face off the embankment and further protect against [erosion](#).



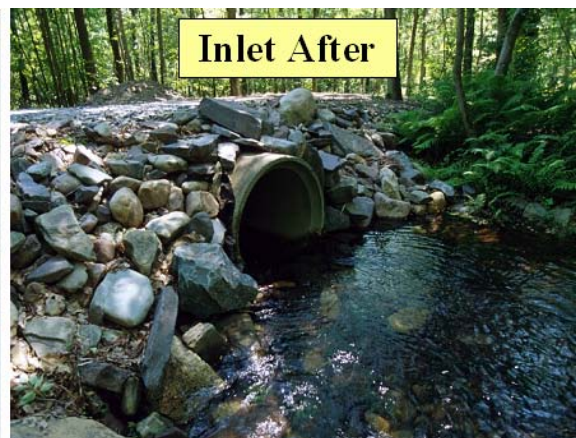
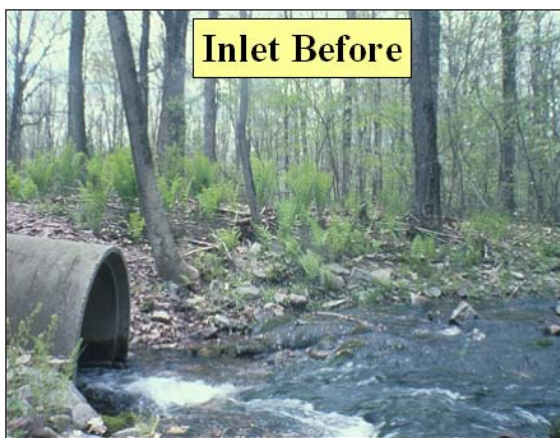
A7-08 Placing large size riprap at ends of pipe.

The road was leveled for a short distance on each side of the pipe crossing using the Stream Saver System discussed in Chapter 5, Section 5.3.6.1. The project was completed in the fall of the year.

The following spring brought the rains, which once more proved too much for the pipe to handle. The road has sustained overflows on several occasions each spring with minimal road damage. The site remains essentially [erosion](#) free. Road overflows are spread out over the



A7-09 Completed project with a leveled road stream saver system.



A7-10 Inlet conditions before and after project.

level road, reducing the velocity and energy of the water. The pipe is better aligned with the stream flow protecting the downstream banks against [erosion](#). The last photos, A7-10 and A7-11, show before and after conditions at each end of the pipe. The project demonstrates one innovative use of [geotextile](#) fabrics in solving the [erosion](#) and [sedimentation](#) pollution at this site.



A7-11 Outlet conditions before and after the project.